

RECORD

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Collection and Field Note Book

No. 79

(May 10, 1966 - Aug. 2, 1966)

(47772 - 48013)

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end # 48013



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R

May 10 - Navy Pipe Line Rd.

Typical Tangled second growth, with *Cecropia*, & other secondary species.

Improving gradually along road. The pipe-line right-of-way is in grass. Woody things removed by cutting.

Stream bed - Hunting Camp
Araceae

Homalomena crinipes

blade ^{lower} primary veins & midrib white
Leaf 70 X 33 cm; anterior lobe 45 cm long;
posterior lobe 27 cm long; petiole for 2.5 cm.
Petiole not geniculate, with up-curved prickles,
1 m. long; sheath persistent, 15 cm long.

BCI

70°-72° - 80°-89°

annual prec. 30-90"

3-4 mo. Jan-April < 10"

Oct-Dec. (start w. rain) wet season

Geophila repens

BCI. Shalluck 130 Harry 286

Herb. BCI

3 steel cases, upright,
single width, 26 pigeon holes.
each pigeon hole 1/10 - 1/4 bulb.

Forest is old secondary
with some fairly large trees.

Columbus ~~Island~~ Iselin
better invite to Sea Level Canal Conf.

Local spots in forest ~~as~~
where ground is wet and
a constant drip, ~~goes~~ comes
down. Produced by a spittle
insect that occurs in masses

May 11 - Trip by car from Balboa to El Valle

First several miles secondary semideciduous forest, well developed. Immediately across the boundary in the republic, there is really very poor vegetation. From here on more and more savanna-like in character, till it becomes a typical *Curatella* - *Byrsonima* savanna.

4 photos Kod. & 12 across El Valle. showing semi-denuded hills.

Cerro Campana is an older volcano just east of El Valle.

Rio Fato

both rock and sand shores
tide 16-20'.

Coastal lowlands are relatively flat, a few feet above s.l., but dissected by sharp steep sided ravines. The material is an irregular friable tuff, quite weathered. Vegetation an irregular tangled tall scrub with taller thickets. *Byrsonima* & *Curatella* very common. In places open, even open enough to be called savanna.

2-3 mi. e. of Bajos
Chame Bay. Large
mangrove swamp extending
~~out~~ in several miles.

This coast has a very
great tidal range, and
around the edge of the
swamp is a strip of
vegetation-free sand.

Labels
typed

May 10 - Navy Life Line
Reserve, about 4 mi. from
entrance along road.

47772 *Helicteres*
x2 common in weedy scrub

May 10 - Barro Colorado Island

x1 73 *Eleusine indica* (L.) Gaertn.
in paths around station

x3 74 *Olyra*
in path in dense old
second-growth forest

shrub ~~1.5~~² m. tall, flowers red.

firmly rooted tufts
(said by Mr. Chadwick to
be a great pest)

tufted, erect or ascending.

May 12 - Fort Clayton
(discussion)

Research Div. (one of 5 divs.)

(part of Test and evaluation command
part of Army Materiel command)

Alpert does not give direct orders but has much influence on what is done.

Res. Div. authorized str. 18 people
now only 12.

activities

- 1 coll + anal. of data on trop. env.
- 2 developing of testing methodology
- 3 actual testing

Psych.

attenuation of sound

" " visibility

anthropometry

Data base project:

Veg.

Microbiology

Macrofauna

- 5 sites
- 2 at Ft. Clayton (existing)
 - 2 at Ft. Sherman (proposed)
 - 1 at Rio Hato (proposed)

Allbrook site - forest

Chivachua site - cleared

Data base inf. unclassified and available

No program for training of help.

Contractor furnishes technicians.
not always any good.

Local areas of faccharum
spontaneum in openings
near old hospital bldg.

Allbrook Tower -
construction of piping (2")
2^m platforms & 45° ladders.

The forest here has a rather
incomplete and irregular
canopy. Base of canopy is 15.5m
officially

site is 100' above sea level.

Semi-deciduous forest.
loose but more or less
continuous 2-4 m shrub layer

About 30-40 m from tower is
an opening a few m across.

Geophila repens

Ft Sherman 1 spec. Blum 1658

old Fort San Diego 1 spec 2207

Herbarium has metal
high racks, room about 15 x 40'
air cond.

Dryer with good capacity,
plenty of heat, but poor
ventilation.

No genus covers yet.

No herbarium cases yet.

Kurt E. Blum and Ed Tyson
have collected several
thousand nos. sent to
Dryer & many are det.
& mounted with plastic.
Still some unlabelled
and many unident. &
unmounted.

Smithsonian Marine
Biology Lab. Naia 9.

Two buildings and a
small pier. Circulating
sea-water system.

A little work has been done
on physical oceanography
by Internam. Trop. Tuna Comm.

Facilities are best for keeping
live animals under observation.
One controlled temp. unit.

One building has huge
tanks, some in good shape.
huge crane to move things.

Small Island near
Smithsonian Lab & Nike site.

Covered by a tangled scrub
of *Bursera*, *Hylocereus*,
various shrubs & vines
with scattered trees

Hippomane mancinella

Bursera simaruba

Ficus

Chrysobalanus icaco

Tecoma stans

Cecropia sp.

Lapinum

May 14 - Flight Panama (Tucuman)
to San Jose, C.R. dep. 7:25 a.m.
(left side, Viscount) arr. 8 a.m.

OTIS has 8 vehicles, need 12.
Trying to get tax exemption.

General course 20 people
(2 18 sections this term)

2 adv. courses (Zool. & Bot.) 10 p. each.
(one bot. only this year.)
different each year.

Interested in 3 types of research
funds

1. Program research
2. Independent "
3. Graduate "

Proposals in for these.

Now want to expand course
work & geographically.

Advanced courses should
follow logically from
fundamentals courses.

Admitted on competitive
basis.

Coop. with fmi.
(sugg. Preston)

1 fertile area of recruitment
of junior personnel
& give staff opportunities
to work with highly
qualified grad. students.

Advanced courses might
readily be taught elsewhere.
On systematic groups
On ecosystems.

Credits good in all universities
of Consortium for graduate credit.
For Michigan & Georgia as
residence credit.

May 15 - flight in small plane from San Jose to Osa air strip. 6:10 a.m. (Passano 180)

Weather generally cloudy with rain showers, except to s.w. Coffee & banana plantation around S.J. Open grassland on hills and in valleys along course, with patches of poor woods, and thinly wooded ravine. Small orchards & coffee at foot of mts. Mts. mostly grassy with hedgerows, small coffee & banana plantations, small crop fields, wooded ravine, scattered houses. Cult. on very steep slopes, considerable erosion. Southward less houses & cultivation, more scattered trees but no real forest. Small patches of sugar cane. Farther on some forest in deep canyons. Fair sized river cutting through mts. some small farms, more grazing than cultivation. Landscape generally grass-green. More and more patches of forest.

Ocean in middle distance on it. Coastal plain fairly wide, broken by range of low hills.

On mt, following down, coast mts. have large areas of "montane tropical wet" forest. Canopy loose, of rounded crowns,

coastal plain mostly cleared, some large plantations, much grass.

Mts. continuously forested, scattered white trees, an occasional yellow-fl. one. Lower reaches partly cleared, some patches of forest remaining on lowlands, esp. backs of small peninsulas in low hills. In lowlands small banana plantation, large oil palm plantation. More land being planted to both, large area. Small streams being channelized in this flat land. Rivers meandering across plain to sea.

Long straight to somewhat curved beach with streams and lagoons parallel to coast behind this. The streams meandering black water. Coastal areas rapidly being cleared, back to lower slopes of mts.

Some swamp along meandering streams back of beach. Tall gray-green somewhat sparsely trees.

Coastal plain pinches out and mts. come to coast. A large muddy river breaks through from a sizable valley system near end of coastal plain.

Coast now alternately sandy & rocky. Mts. still partly

largest are Carapa
shrub layer 2-3 m.
conspicuous but not
difficult to penetrate
then ground layer.
Cyclanthaceae in shrub
layer. many seedling
of trees. *Homalomena*. *G. rogyne* (palm)

Palms abundant in
under story, mostly fan
palms. *Chrysophyllum* to 10 m.

Most trees well-buttressed
Locally trees may be
only a few m apart.

Almost no ferns on ground
a few on bases of trees, mostly
Andropogon-like.

Ipomoea *mombin* -
large forest tree.

Xylocarpus has branched
thorns.

Ochroma, *Calathra*, *Cecropia*
in open along rd.

Huberodendron on ridge top
leafless. lvs. beginning to come
out, very high buttresses.

Ridge site *Rigto R.* 100+ m 21
about 4 km. s. Rincon Bay

A site on a ridge has
very tall forest in many
respects similar to that
at Venagas. Vines more
abundant. Undergrowth
rather thick. Layering
indistinct.

Jamia common.

Palms, esp. *Asterostigma*,
common in shrub layer.

Soil deep yellow,
fine grained. Erosion
headward, forming
cirque-like valley heads,
very steep-sided
ridges.

Tall forest general
except where slopes are
almost cliffs.

Caryocarpus has no
buttresses, cylindrical trunk,
large, lvs. trifoliate,
opposite, stipule calyptate,
caducous.

Top of ridges flat, narrow.

May 15 just west of Rincon
Swamp. Tidal
Mora upstream
mangrove down.

Thicket of a slender
spiny *Crataegus* with a large
dark purple edible fruit
(pulp thin, fibrous but
pleasantly acid). Tangles
of a shrubby bignon. *Enallagma*
with large calabash-like
fruits. ^{Thickets} of
a *Randia* (sterile) and a
bare bignon with white
flowers. Mora still present.
Then a mixture of tall
Rhizophora with some large
Avicennia. Trees of both to
20-30 m. Most of *Rhizophora*
have prop roots emerging up to
2 m. and widely arching. A few
have them hanging from
half way up tree.

Hills bet Rincon and
west coast of peninsula
well forested with
Tropical wet forest,
rounded crowns, canopy
complete to perhaps 75%.
Many palms in undergrowth.

Large mangrove swamp
with matrix of mature
open to closed mangrove
forest. patches of dense
young mangrove, and
meadow-like patches
of *Acrostichum*. But
no obvious belt-zonation.
except taller trees lining
most of meandering channels.
Crowns of mangroves
tall, narrow, spire-like,
except where trees are
well separated, when
they are broad and rounded.

Valleys of Rio Banjo & Rio
Naranjo are broad and flat,
bottoms are planted to bananas,
papayas, oil palms, etc. Hills
are almost entirely denuded.
Much pasture along Rio Naranjo
lower course.

Hills south^{west} of San Jose
are denuded and beginning to
show signs of accelerated erosion.

*Samuel
Lynch*

May 15 - just west of
Rincon, base of Osa Peninsula

in mangrove swamp
at mouth of river

- 47775 *Ficus*
occasional in undergrowth
- 76 *Ardisia*
very common in undergrowth
- 77 *Aricennia*
occasional
- 78 *Acrostichum aureum* L.
abundant, especially
in open areas
- 79 (bignon.) *Tabebuia palustris* Hemsl. det. A. Gentry 1974
local in undergrowth
in open-forest part of

May 15 4 mi. S of Rincon
on ridge along Rio Riquito,
base of Osa Peninsula
in tall primary
"Tropical Wet Forest"

*with
W.H. Hatheway*

- 80 *Durio*
occasional in undergrowth
on steep slope +7, +7 +5
- 81 fern *Trichomanes diversifrons* (Bory) Mett.
common on flat ridge top
- 82 (annon.)
one tree seen +1

tangled large
shrub or small tree
tangled shrub,
ripe fruit fleshy, black.
large tree, 20 m. tall,
flowers pale buff.
leaves pale beneath
veins visible above.
rhizome short, erect,
fronds erect, young
ones reddish green.
tangled shrub,
mound-like, mostly
leafless; collar white,
throat rather flattened.

det.
Kellinger
1978

slender erect shrub
with single main stem, 4-5
m. tall; corolla white.
rhizomes and fertile
fronds erect.
slender understory tree,
flowers green, stamens
cream.

26

1966 Costa Rica

47783 Psychotria
on flat ridge top

84 Duroia
on flat ridge top

85 Laurauja
rare on flat ridge top

May 15 Vanegas River

in tall ~~dry~~ primary
tropical wet forest
on very flat ~~dry~~ heavy
clay soil

86 Randia +8, +8, 1

May 16 - headw. of Rio Siquine,
below Alto de Guayacan,
east of Turrialba
in thick disturbed Tropical
(wet forest, ~~with~~ dense
undergrowth)

87 Cephaelis +5, +5
~~very~~ very common

88 Psychotria
common

89 Psychotria Rudaea cornifolia (H. + B.) Handley
occasional det W.C. Burger 1992

90 Blakea
occasional

27

shrub 3 m. tall;
inflorescences fleshy,
fruit very immature.

shrub 2.5 m. tall
flowers white.
very slender shrub
2 m. tall, flowers white.



MISSOURI BOTANICAL GARDEN (M)

Family: RubiAc.

Country: COSTA

Collector: Fosberg, F.R. 47788

Acronym: US/CR
(return chit to)

Determination: Rudaea cornifolia (H. + B.)
standley

predet. R. amplexicaulis

Determined by: W.C. Burger, 1992 Acronym: F

To be completed by MO staff.

☐ Accepted
on Computer

☐ Typed on
Duplicates

☐ Entered in
Field Book

☒ Recorded &
Mounted in
Sheet (or if

shrub 3 m tall,
pale greenish,
flow.

up to 3 m. tall,
soft, green-stemmed shrub,
bracts rose-red, corollas white.
low shrub, up to 1 m. tall,
flowers white.
shrub, thickly branched,
2 m. tall, buds yellow, corollas cream.
large woody vine, bracts
reddish, fruit pale bronze-
green.



MISSOURI BOTANICAL GARDEN (M)

Family: RUBIAC.

Country: COSTA

Collector: Fosberg, F.R. 47788

Acronym: ^{US}/_{CR}
(return chit to)

Determination: *Rudkea cornifolia* (H. + B.)

Standley

prev det. *R. amplexicaulis*.

Determined by: W.C. Burger, 1992

Acronym: F

To be completed by MO staff.

☒ Recorded
on Computer

☒ Typed on
Duplicates

☐ Entered in
Field Book

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Mounted
Sheet (or if

47783 Psychotria
on flat ridge top

84 Duroia
on flat ridge top

85 Saurauja
rare on flat ridge top

88

~~Vanegas~~
May 15 Vanegas River

in tall ~~stop~~ primary
tropical wet forest
on very flat ~~gro~~ heavy
clay soil

86 Randia +8, +8, 1

May 16 - headw. of Rio Siquines,
below Alto de Guayacan,
east of Turrialba

in thick disturbed Tropical
wet forest, ~~with~~ ⁱⁿ dense
undergrowth

87 Cephaelis +5, +5
~~stop~~ very common

88 Psychotria
common

89 Psychotria Rudgea cornifolia (H. & B.) Handley
occasional det W.C. Burger 1992

90 Blakea
occasional

shrub 3 m. tall;
inflorescences fleshy,
fruit very immature.

shrub 2.5 m. tall
flowers white.

very slender shrub
2 m. tall, flowers white.

100 m

slender shrub 3 m tall,
flowers pale greenish,
fruit yellow.

750 m

up to 3 m. tall,
soft, green-stemmed shrub,
bracts rose-red, corollas white.

low shrub, up to 1 m. tall,
flowers white.

shrub, thickly branched,
2 m. tall, buds yellow, corollas cream
large woody vine, bracts
reddish, fruit pale bronze-
green.

May 16 - forest at headw. of
Rio Sigües, below Alto
de Guayacán. 750 m

Slope rather steep,
irregular forest
with almost no
canopy, merely abundant
emergents from a tangle
of tall shrubs, ferns,
etc. This tangle is so
dense as to necessitate
cutting continually to walk.
Very few trees over 3 dm dbh.

The forest along the trail
is taller and denser, but
quite degraded - useful
timber has been removed.

above San Jose de la Montaña,
May 17 - w. slope of Volcan
Barba. Steinwath hacienda.
Around ranch abundant
planted *Cupressus lusitanica*
and *Alnus jorullensis*.
Native forest of *Cornus*
disciplina and *Nectandra*
+ associates.

Above, at about 1900 m
the rather flat interfluvium
bet. two densely wooded
ravines has been cleared
and is a pasture of a
great collection of
widespread weeds
- *Plantago virginica*, *Hypochaeris*
radicata, *Oxalis corniculata*,
Gnaphalium purpureum etc.

The forest - ~~lower~~ lower
montane wet (S.H.)
is a dense rather irregular
single tree layer, with
a well developed shrub
stratum about 2-4 m. tall
of *Palicourea*, *Hoffmannia*,
etc. Forest of *Cornus*, etc.
about 20 m tall.

4 *Palicourea* a yellow
(shrub 2 m.), an orange with
red infl. + thicker stipular points, +
a purple (*P. ang.*) and a pale

lavender bush 3+ m. tall.
Many epiphytic
ferns + *Ericaceae*.

2000 m. *Quercus* forest
about 20-25 m. tall,
with rubiacious shrub
layer 2-5 m. tall, with
considerable moss.
Looks like forest on Chang Dao
ridge above tea plantation
in Thailand. Some spots
almost bare of undergrowth.

This forest also has
Turpinia, *Myrsine*, *Rouphala*,
Guettarda, *Magnolia*,
Aiouea, *Alnus*, *Clusia*,
Prunus, various *Melastome*
and *Blakea*, *Catappa*, *Caesalpinia* +
Miconia.

Tournefortia, *Weinmannia*,
Dendropanax, *Oreopanax*.

2100 m Lower Montane Rain Forest
about 20 m. tall, single tree
layer, rather open shrub
layer, canopy complete
trees somewhat but not
conspicuously gnarled, some
up to 30-35, rarely more cm dbh
spacing 1-4 m. Epiphytes
~~very~~ abundant, trunks
thinly but densely mossy.

Composition very mixed.
~~the~~ Drimys common, one
 tree easily 4 dm dbh & 25 m tall
 some lianas - Cyclanthus.
 a few Anthuriums.

One old Persea americana,
 A few very large trees
 here and there.

Rubiaceae, Melastomaceae,
 etc. in undergrowth.

Photos of Cornus - Prunus
 forest 1 hr & 3 bod.
 rounded clumpy dense
 tops of trees cornus light green.

1940 Costa Rica

with
W.H. Hatheway
R.D. ~~Smith~~ Nicolson

May 17 - above San José de la Montaña,
on W slope of Volcan Barba
in Lower Montane Wet Forest (S.H.)
at edge of pasture

- 1950m

47791 (asclep.)
12

 $+5, +5$

42 92 (celast.) *Microtrichis*

X₁ 3 93 (ulmac.) (pterocarya - 'elkova) +5, +5, 1
rare, left in pasture

12 94 symplectic +5, +5
occasional

95 *Villaresia costaricensis* (C. Citronella c.)
occasional

$$+ 5 + 4$$

10 96 (Theor.) + 4, + 4
occasional in pasture

97 *Palicourea* *occasional* wood?

8 98 Deppea
common

✓ 8 99 Bidens
common

47800 *Morus insignis*
rare tree, left in pasture

woody twines with
white latex; corollas
dirty pinkish white.
~~large~~
~~small~~ tree.

tree 3 dm dbh 20 m tall,
fruit green.

small tree; fruit green.

medium sized tree,
flowers white, fruit
fleshy, blue-black glossy.
small tree, 10 m. tall.

shrub under 1 m. tall
inflorescence greenish yellow,
corollas lemon-yellow.

slender shrubs 2-3 m. tall,
flowers bright yellow (several individual
in ~~the~~ collection).

scandent suffrutescent
herb or shrub, scrambling
in trees and pendent,
several ^{or} many meters long,
rays yellow, disk
greenish yellow.

tree 20 m. tall, leaves
very rugose; fruit red,
pendent.

47801 (rub.)

single tree left in pasture

02 (~~theac.~~) *Rhacoma tondugii* (?)

occasional

03 *Linociera*

rare at this elevation

04 *Hoffmannia steinbockii* Fock.
very local, on banks
of stream in dense
forest.05 *Hoffmannia*
local ~~in forest~~ ~~near~~ stream
in dense forest

06 (rub.?)

one tree seen in opening
near stream.07 *Palicourea*

occasional in forest

08 *Palicourea*fairly common in edges
of forest09 *Hoffmannia*

rare in forest

10 *Palicourea*fairly common in forest
and at edges of forest11 *Cornus disciflora*

very common, one of dominant

12 *Peperomia cf. tetraphylla*

occasional, on tree trunks.

Tree 15 m. tall; flowers
white, drupes bright
red.

small tree

small, almost
leafless tree, fruits
blue-black.shrub 1.5 m. tall,
flowers reddish-orange,
fruits reddish black,
fleshyshrub 1 m. tall, flowers
whitish, turning orange,
fruit malformed, red.~~shrub~~ shrub 1.5 m. tall,
fruit fleshy, dark red, glossy;
flowers white.shrub 3 m. tall, thyrse
red, flowers pale lavender.shrub up to 1.5 m. tall,
thyrse ~~red~~ yellow green,
corollas lemon yellow.shrub 1 m. tall, scarcely
branched; fruit immature.shrub 3.5 m. tall, thyrse
red, flowers orange.fairly large tree, bracts
whitish, closely investing
buds, early caducous; fruit
immature.

leaves fleshy

1966 Costa Rica

X47813

Palicourea

2

occasional in edges of forest

X2

14

~~Didymaea~~ ⁺¹

common on base of tree
in pasture

X3

15

Viburnum

occasional

X5

16

Palicourea

common in edges of forest

X4

17

Palicourea angustifolia

occasional

same, oak forest

X4

18

Guettarda poasana

edge of forest

X5

19

Blakea

occasional in edge of forest

X6

20

~~Guettarda~~ *Roupala*

occasional

glaberrima Pittier

same

X7

21

Hoffmania steinboothii

very local in dense forest
on bank of stream

X2

22

?

very rare

X6

23

Hoffmannia

very local on banks of
stream in dense forest.

X3

24

Cephaelis axillaris

occasional in dense forest

Heredia Prov.

shrub less than 1 m. tall,
thyrses yellow-green, flowers
lemon yellow.
creepers, fruits blue.

small tree, fruits black

shrub 3 m. tall; thyrses
red; corolla orange.

shrub 3 m. tall; thyrses
reddish, corolla magenta.

2050 m

large tree; corollas purplish
outside, lobes white, crisp; fruit black.
large vines on trunk
of tree, petals white,
fruit red.

small tree, flowers
white.

2000
1475

shrub 1.5 m. tall, flowers
dull orange. fruit globose,
fleshy, reddish black.
(topotype)

shrub less than 1 m. tall,
sterile.

shrub 1.5 m. tall; flowers
dull whitish; fruit immature.

green-stemmed low shrub,
bracts dull purplish,
corolla white.

Labey
✓ typed
40

1966 Costa Rica

47825

Palicourea

occasional in *Quercus* forest

x4

x9

26

Guettarda poasana

occasional in *Quercus* forest

x2

27

Uncinia

common on wet ground.

same - dense mixed ^{poor} Montan
Rain Forest.

2100m

x2

28

Persea americana ?

rare

x2

29

Hoffmannia

rare

x1

30

Burmeistera

very rare on moist ground

x2

31

Nertera

very local

x1

32

?

rare

x3

33

Palicourea

occasional

x2

34

?

rare

x4

35

Palicourea

occasional

x7

36

Palicourea

occasional

x4

37

Centropogon

occasional

Heredia Prov.

41

shrub 3 m. tall. thyrses
red, corollas orange-
yellow.

large shrub; flowers
white, lobes with crisped
margins, purplish outside,
fruit black.

great broken-off trunk
with large sprouts,
leaves glaucous beneath;
sterile

erect shrub 2 m. tall,
buds orange-red,
corolla bright yellow.

prostrate, fruit red,
juicy.

shrub 1 m. tall,
buds greenish.

shrub 3 m. tall, ~~flowers~~
thyrses red, flowers pale lavender.
small shrub; sterile.

shrub 4 m. tall, thyrses green,
corollas yellow.

shrub 3 m. tall, thyrses
yellow-green, corollas yellow.
herb 0.7 m. tall, corolla
scarlet, lobes of waxy yellow.

47838 *Palicourea*
occasional

Irazu

with W. H. Hatheway
& D. H. Nicolson
May 18. Volcan Irazu
in deep volcanic ash
on crater rim

X 77 *Arctostaphylos*
common

X 40 *Vaccinium*
common

✓ 3/5 X 41 *Lobelia laxiflora*
very common on road cuts

May 18 Volcan Irazu
along highway to summit

✓ 2 41a *Coriaria ruscifolia*
common ~~for~~ in a very
limited area along road cut

shrub 2 m. tall; thyrses
red, corollas lavender.

3200 m

sprouting shrub,
flowers cream white.
sprouting shrub, fls.
cream white, berries blue.

2100 m

shrub up to 1 m. tall,
sparsely branched,
corollas scarlet.

scrambling semi-scandent

May 18 - auto trip up Irazu V.

Just before Cartago road crosses a wide stream bed site of 1964 mud flow. This is contained between high levees pushed up by secebes on AID program.

Trees in Cartago

Araucaria excelsa

Cedrela sp.

Casuarina equisetifolia

Lalix chilensis

Persea americana

Tecoma stans

Schinus molle

Cupressus "Guatemala Cypress"

Roystonea oleracea

Phoenix canariensis

Lower slopes above Cartago
1500 - 1700m grassy pastures and cult. patches separated by hedgerows and wooded ravines.
Lower Montane Moist zone (S.H.)
(1600 - 2300m range acc. Hatheway)
(Potatoes, onions, etc. cult. + good pastures, not too much leaching). Deep ash soil.

Most of ash was blown directly over peaks Central and San Jose.

Lobelia laxiflora on cut bank at about 2000m. - 2150m.

Caixa cf. *candamarcensis* at about 2200m.

At 2350m - 2500m, + the oaks-filled ravine seems still in good shape.

Above ~~2350~~ ²³⁵⁰ *Acnistus* lines road in places.

Above 2400m Montane Wet Forest zone (S.H.). Indicated by *Buddleja* sp. (tree, gray lvs) (*B. alpina*?)

2600m. oaks in ravines and scattered on slopes. Slopes grassy. ~~for~~ mostly *Pennisetum clandestinum*. Some cultivation.

2700m Alms and oaks, *Buddleja* scattered on grassy slopes. Horizontal ditches on fractured slopes are quite conspicuous. Constructed to stabilize slopes and prevent mud flows.

At 2840m. *Criaria* lines road. *Escallonia* begins here.

Pennisetum colonizes ash very well here.

Gunnera in ravines.

Around toward east is an open forest to savanna of *Buddleja*, oaks, araliads. *Buddleja* becomes dominant until it is essentially an open *Buddleja* forest.

Above this ash beds half covering open scrub. Most of shrubs are sprouting. *Lupinus* and *Deschampsia* (?) colonizing ash at 9450 m. + up. Upward the sprouting is less pronounced, but still many shrubs are sprouting, even on crater rim.

Inside rim most of the vegetation is gone - the slopes on which I collected in 1962 are just bare ash. At top of road, ~~and~~ below observation platform are a few stubs some of which are sprouting.

Ash flat just back of where old observation point was is bare.

Arctostaphylos on rim is sprouting and flowering. *Vaccinium consanguineum* also flowering.

No colonization on rim but down just a little *Lupinus*, several grasses,

photos
to + no
color
outside
slope
and inside

Rumex acetosella, *gnaphalium* sp. are colonizing actively. However, a half dozen cattle were grazing on this along road.

What appears to be *Eupatorium adenophorum* in *Buddleja* forest.

Locally much *Escallonia* in *Buddleja* forest. *Myrsine* dendron seems often epiphytic on or in some way associated with *Escallonia*.

Tricholaena rosea on roadside bet. Cartago and San José.

May 29 - just north of
Gooney Run Overlook
Trees almost fully
leafed out, except some
oaks that are still somewhat
bare-looking. Many
roadside flowers out.

Lands Run Gap and Fire
Road -

collected several plants in
gap, then several a few
hundred m. down, in on
road cut and embankment.
Stellaria pubera fruiting -
the fruiting branches procum-
bent the sterile ones erect.
Equisetum on a loose road
fill.

Lands Run Falls -

a beautiful series of falls
and cascades below
Fire Road where it crosses
the run. A "bathtub" at
top of falls.

But Compton Gap & Jenkins
a thin wooded flat with
Kalmia and *Rhododendron*
~~very~~ forming a well
marked 1-2 m shrub layer.
Rhododendron nudiflorum,
but variable in flowering

2100'

tinge and color - pale
ones in full flower, pinker
ones about over. Odder varies
but no strong clove odor.

E. of Jenkins Gap on a
gentle w. slope,
colony of *R. roseum* in
rather thin woods.
~~Varies~~ Varies somewhat
in color, st. tinge of
orange in some. Clove scent.

Flat along Smith-Road
Fire Road south of High Top.
Very rocky old orchard,
now grown up to
a thin stand of small
Robinia 5 m. tall or so,
and *Rubus argutus*.

Farther down, near
top of steep slope -
ground even more
rocky, a thin stand
of oaks on almost bare
rock near top of low
cliff. Farther away
some *Robinia* and then
almost pure stand of
young ash. *Botrychium*
virginicum common.
Thalictrum cf. *diocum*.
Smilacina racemosa.

May 29 - Skyline Drive
just north of
Gooney Run Overlook
in grassy area along
~~Skyline Drive~~ highway
~~Viola~~ *Viola triloba* Schw.
common

x 3
x 2 43 *Carex*
occasional

x 2 44 *Carex*
occasional

x 1 45 *Cerastium*
occasional

x 2 46 *Geranium*
common

same - in thin oak forest
on rocky ground

x 4 47 *Lathyrus?*
locally common

x 3 48 *Vicia*
locally common

May 29 - Gooney Run Overlook,
Skyline Drive
in grassy area, semi-open.

x 4 49 *Trifolium*
abundant in patches

x 1 50 *Lagotis*
common

x 4 51 *Lepidium*
abundant in patches on
otherwise bare soil

petioles erect; flowers purple.

culms spreading to
ascending.

plant caespitose,
culms spreading.

plant weak; flowers white

stems spreading from
slender root crown;
flowers deep rose.

flowers magenta

flowers pale lavender.

flowers light yellow.

flower white

erect; flowers yellow.

nos. checked

52

labels typed

for Xerox

47852

1966 Virginia

Tragopogon

rare

Oxalis

occasional

Crataegus

one tree seen

Maclura pomifera

one tree seen

Gleditsia triacanthos

one tree seen

same - on boulder talus
below overlook

Bromus

abundant

Hesperis

one large patch

May 29 - Land's Run Gap
in ^{thin} second-growth forest

Barbarea vulgaris

one plant seen

Barbarea vulgaris

common along road

May 29 Lands Run Fire Rd.

grass

very common on fill along road

Equisetum arvense

local on fill along road

Shen. Nat. Park

53

erect, ligules yellow.

flowers bright yellow.

small ~~tree~~ closely
branched tree; petals

white anthers dull purple.

small tree; bark dull

yellowish; sterile, leaves

not quite mature.

small scraggly
tree with branched
thorns on trunk.

spikelets drooping

flowers varying from
white to deep magenta
in same colony.

flowers pale yellow.

flowers bright yellow.

erect, small tufts.

nos. checked
54
typed for Xerox

1966 Virginia

47863

Stellaria pubera
common on road cut
and roadbed

5

May 29 - Land's Run Falls,
on Land's Run Fire Rd. in

x1

64

Carex
on rocks near stream

x1

65

Barbarea
occasional in road

12

66

Galium aparine L.
occasional in weeds
along road.

~~27~~

May 29 - Skyline Drive
between Compton Gap
and Jenkins Gap
in ericaceous shrub
layer in thin oak forest

12

67

Rhododendron nudiflorum
common

x

68

~~*Antennaria*~~

~~rare~~

x1

68

Antennaria

rare

12

69

Rhododendron nudiflorum (d.) Torr.
occasional

May 29 - Skyline Drive,
milepost 16, bet. Jenkins Gap
and Hogwallow Flat Overlook
in scrubby forest on gentle
west slope

Shenandoah Nat. Park 55

sterile shoots erect,
fruiting ones procumbent.

dense forest

caespitose, culms
strongly ascending.
erect flowers bright
yellow.
weak, supported by
weeds.

shrub 2 m. tall,
corolla tubed, limb pale
pink; odor not very good.

stem prostrate, scaly
erect.

shrub 1.5 m. tall,
flowers pink, tubed,
odor not very good.

47870 *Rhododendron roseum*
common

71 *Maianthemum canadense*
very common

72 *Rhododendron roseum*
common

May 30 - 3/5 mi. s. of Hightop
head of White Oak Spring Branch
in thin oak forest on
rock outcrop

soil only in pockets and thin sh

73 *Rubus idaeus* L.
occasional

74 *Rubus*
very common

75 *Sanguinaria canadensis*
abundant, rhizomes
in crevices between rocks.

76 *Potentilla simplex* Michx.
common locally

77 *Arisaema triphyllum* L.
rare

78 *Carex*
common on rock ledges

79 *Arisaema atrorubens*
occasional

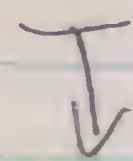
80 *Puccinia*
parasitic on *Arisaema atrorubens*

shrub 2.5 m. tall,
flowers bright rose
pink, odor of cloves.

shrub 2 m. tall
flowers bright pink,
odor of cloves.

945m

3100'



canes sprawling, ^{rooting at tips,} leaves white
beneath, flowers white.

canes sprawling to
prostrate, rooting at
tips; flowers white.

rhizomes dull orange red,
latex reddish, leaves
glaucous beneath.

stems low arching to
procumbent, flowers yellow.
leaves clear green beneath,
spathe green, not well
opened (abnormal?).

leaves glaucous beneath,
spathe deep purple, stripes
with white.

58

typed for Xerox

1966 Virginia

atro rubens

47881

Arisaema atrovirens ?

X 287 1

occasional

X

82

Arisaema atrovirens ?

occasional

X

83

Carex

rare

X

84

Carex

occasional

X

85

Ranunculus allegheniensis Britt

locally common

X

86

Ranunculus abortivus L.

locally common

X

87

Woodsia obtusa ?

rare, at top of small clifflet.

X

88

Viola palmata L.

rare

X

89

Libana virginica (L.) Rollins

rare

X

90

(grass)

rare

same - in thin *Fraxinus* forest with some *Robinia*, on

X

91

Carex

along old road

X

92

Carex

along old road

X

93

Carex

in deep leaf mold

Shen. Nat. Park

59

leaves scarcely glaucous, but not quite clear green beneath; spaths purple, striped with white inside.

leaves scarcely glaucous but not quite clear green beneath; spath green.

945 m.

3100'

small tufts, culms spreading; slightly glaucous. large rather loose tufts, culms ascending.

petals yellow.

petals yellow

flowers purple, lower three petals white at base, lateral ones bearded, lower striate with black.

flowers white

erect

very rocky ground

loose tufts

loose tufts

culms spreading, plant somewhat glaucous

nos checked
ready for work

60

1964 Virginia

47894

Viola

common in old road

59

X1

95

Viola triloba ~~Schub.~~ Schw.

rare in old road

54

97

Rhododendron nudiflorum

rare

54

96

Rhododendron roseum

rare

X1

98

Ranunculus bulbosus

common in old road

52

99

Prunus virginiana

occasional

51

47900

Sambucus racemosa

rare in undergrowth

X2

01

Viola rafinesquei

very local at roadside

51

02

Veronica peregrina L.

rare along old road

54

03

Senecio aurea

common, especially along old road

X1

04

Smilax herbacea

rare

Shen. Nat. Park

61

leaves erect; flowers purple,
lateral petals ^{bearded} bearded at
base, lower one striate with
black or white at base.

(possibly 2 species?)

leaves erect; fls. purple.
petals white at base,
lateral bearded, lower
striate with black.

shrub 2 m. tall; corolla
tube red, ~~lobes~~ very
pale pink, ~~upper~~ upper one
very ~~slightly~~ slightly
yellowish in center, spot
at all clove scented, odor
faintly unpleasant.

shrub 2 m. tall, flowers
bright pink, tube deeper,
upper lobe with orange patch
in center, clove scented.

flowers yellow, showy.

shrub 2.5 m. tall.

shrub 2.5 m. tall,
fruit immature.

erect, flowers deep yellow.

erect, subglaucous

ctd. from p. 49.

Cimicifuga, *Aster*
macrophyllus (a),
Sanguinaria (o),
Galium aparine (o),
Geranium perfoliatum (l),
Hydrophyllum virginicum
(c), *Clematis*, *Rhus*
toxico-dendron, *Dioscorea*
quaternata

Understory of *Crataegus*
and *Hamamelis*. *Icthyga*

Apparently there has
been a hard frost after
things began to grow
this spring. Many
Smilacina and other
herbs seem to have been
frozen back. *Carya* ^{*ostya*} buds
killed. Perhaps this
is the reason the oaks,
Robinia, etc. show little
sign of leafing out yet.

Fire road trace, in
and immediately alongside -
Ranunculus bulbosus, *Cerastium*
viscosum (?), *Taraxacum*,
Poa spp., *Hieracium*, *Prunella*
lagina, *Viola* spp., *Fragaria*,
Allium vineale, *Veronica*
peregrina, *Achillea millefolium*,
Viola rafinesquei, *Panicum* sp.

Just below

Just below top of High Top
on Appalachian Trail is a
rock shelf like a diminutive
Crescent Rocks. but has a
poor flora - *Gaylussacia baccata*,
Sedum telephium, *Spirea betulifolia*,
Pyrus (arbutifolia) (glab.),
Pyrus americana,
Lolidaga roanensis v. *monticola*,
Maianthemum,
Quercus rubra,
Betula lenta,
Dennstaedtia punctilobula,
Carex spp. 3,
Menziesia pilosa

not checked
labels ready
for file
64
47905

1966 Virginia

from p. 46

Lepidium

rare, near old road

x2 06 *Poa*

common near old road

x1 07 *Thalictrum dioicum*

very common

x4 08 *Prunus serotina*

~~rare~~ occasional

May 30 - south slope of High Top
in thin second-growth
oak woods

+8 09 *Veronica peregrina*

abundant along Appalachian Trail

+7 10 *Tradescantia virginica*

occasional

x2 11 *Tradescantia virginica*

occasional (with #47910)

May 30 - near summit of High Top
on ledges on rock cliff

x3 12 *Carex*

small patch

x2 13 *Carex*

a few tufts

x3 14 *Menziesia pilosa*

to p. 48

Shen. Nat. Park

65

erect

945 m.
3100'

erect

mostly not yet flowering,
roots yellow.

↑

small tree, petals white;
twigs with very strong
odor when broken.

erect; corollas blue, falling
easily.

petals deep purple.
(varying to paler and to
dull or bright rose pinks),
filaments with copious
purple hair, anthers yellow.

petals deep rose pinks, (f varying
to dull rose pink, light blue-purple
and to deep purple), filaments
with copious deep rose pink
hair.

forming turf

small tufts

shrub (an. cal. corollas
yellow with coral tips)

May 30 High Top

Upper part covered with scrubby oak forest - the older trees showing typical low stature, thick conical trunks of high place. *Betula lenta* and *alleghaniensis* occasional. Thin low shrub layer of *Corylus*. Herbs abundant. Oaks scarcely starting to put out leaves. *Corylus* & *Betula* with half-grown leaves.

The tower has been taken down.

Mouth of North River
Picnic Ground, just s. of Baldface Mt.
An old clearing ^{Overlook}
on w. side of drive - 3200'
filled with *Crataegus*,
Rubus, *Prunus*, etc.
a queer glandular
Rubus is common.

June 12 - Potomac River above
Shepherdstown
Nicki Wilson place,
Steamboat Run Estates.

Botrychium virginianum
Acer nigrum
Quercus prinus
Asimina triloba
Parthenocissus quinquefolia

not checked
68
ready for Xerox
47915

1966 Virginia

from 10.64

Carex

on shaded ledge

~~16~~

same - in scrubby oak forest

21 16

Zizia aptera (Gray) Fern.

~~very~~ common

21 17

Zizia aptera (Gray) Fern. forms
rare

X1 18

Thaspium barbinode (Michx.) Nutt.
common

X1 19

Cypripedium calceolus m. pubescens
(Willd.) Cornell
rare

May 30 - 3/5 mi. s. of High Top

in scrubby oak forest

X4 20

Pyrus malus L.
occasional

May 30 - Smith-Road gap

in grassy opening

+7 21

Crataegus
occasional

May 30 - 1 mile n. of South River

Picnic grounds

old clearing now

choked with Rubus and Crataegus

X4 22

Rubus saxosus Bailey?
locally abundant

X3 23

Crataegus
locally abundant

Shen. Nat. Park

69

small tufts

flowers clear yellow.

flowers rusty yellow.

flowers pale yellow.

perianth segments bronze.
lip yellow.

small tree, fruit immature.

shrub 2 m. tall;
petals white; anthers dull pink.

canes stout, erect, to 2 m
tall, slightly arching
at tips.

shrub 4 m. tall, flower white, anthers
purple.

no 70 checked
ready for
herb

1966 Virginia

May 30 - east side of
Hawksbill Mt., m.p. 47 on
Skyline Drive.
in wet boggy spot
beside road

47924

Viola

X1

occasional

X1

25

Viola

common

X2

26

Carex

label
written

1966 District of Columbia

June 4 - Capitol Hill

X1

27

Lepidium sativum L.
weed in garden

Shen. Nat. Park

71

flowers purple.

flowers purple, white in
center, lower petal striate.

petals white.

June 17 - Ravensworth Shopping Center
Braddock Rd. & Beltway

In the south west
quadrant (away from
Wash., away from Alexandria)
is a large tract of
good old second-growth
mixed hardwood
forest. Variable in
composition - beech
locally common.

On some areas there
is an under-layer
of *Ilex opaca*.
Polystichum acrostich-
oides is common, locally
abundant. The
layer is so thin that
walking is ~~abundant~~
very easy.

A small stream
cuts across it, lined
with willows and
some open herbaceous
vegetation.

Rotted fallen trees
are abundant.

Lonicera japonica
rather abundant
along stream and
on edges toward
Braddock Rd.

June 20 - left Wash. 6 p.m. left
Dulles 7:30 p.m. Delay in N.Y.

June 21 - arrived Paris
12:15 p.m. left Paris
1:40 p.m. an. Geneva. 2:40

Overcast and slight rain
at Orly.

1966 ~~Switzerland~~ FranceJune 21 ^{above Thoiry} ~~the~~ slope of Jura
Mts. west of Geneva.

375-500

Intensive cultivation
on glacial terrain at
foot of mts. Lower slopes
more or less open but
no longer cult. Some
grazing. invasion by
Crataegus, *Juniperus*, *Corylus*
etc. from ~~the~~ hedger-
forming woodland,
tending to go back to
forest. Above this a
belt of deciduous
forest - *Quercus* with *Fragaria*
Filix, *Acer*, etc.

850 m
+ up

Above this a belt of
Abies. Above the ~~the~~ conifer
belt is a belt of meadow
and snow patches. but
in places scrubby + mixed decid. + conifers.
In the deciduous forest
belt many chestnut but
are being slowly eliminated
by blight.

The scrubby belt above
the conifers is well
developed in some areas,
in others pushed down
by grazing and even
cutting. The grassy ~~at~~
summits are kept so
by grazing, but the

woody species grow very
slowly here.

At 1300 m. the *Abies* begins
to give way to *Picea*.
Fagus becomes abundant
and co-dominant in forest.
Here rain is ~~about~~ about 2 m
and there ~~is~~ is a boggy
moss coating on rocks.
This is limestone country
and ~~in spite of~~ in spite of
this *Vaccinium myrtillus*
is abundant. No pine
but both *Abies* & *Picea* are common.

The forest is rather open
with still a ~~sparse~~
~~undergrowth~~ undergrowth.
Urtica nigra, *Rosa* sp.
Almost without prickles

A couple of saxifrages.
Paris quadrifolia.

Beeches here are ~~small~~
small-leaved, almost
look like *Nothofagus*.

1100 m meadow with *Gentiana*
lutea, *Galium boreale*, etc.

June 21 - s.e. slope of Jura Mts.
above and s.w. of ~~the~~ Choring
w. of Geneva.

in coniferous forest

47928 *Cotoneaster tomentosus*

on open limestone exposure

29 *Viburnum lantana*

~~very common~~ occasional

in scrubby spot

30 *Laburnum*

very common in scrubby areas

31 *Lonicera*

occasional in scrubby area

32 *Ranunculus*

common in openings

33 *Ajuga*

in open meadow

34 *Lamium*

in open meadow

35 *Galium boreale* L.

common in open meadow

36 *Asperula*

on limestone rocks in openings

to p. 116

950 m shrub 1 m. tall, bushy,
buds white.

1000 m shrub 1.5 m. tall, fruit
immature

1050 m large shrub, 3-4 m. tall,
racemes pendent, flowers
bright yellow.

1200 m shrub 1.5 m. tall, fruit immature.

1250 m flowers white.

1100 m. flowers deep blue-violet.

1100 m flowers yellow marked
with red.

1100 m flowers white.

1300 m flowers white.

June 25 - left Geneva 6:43 a.m.
(taxi 5 fr.) by rail. (fare to Vevy 77.20)
Shirred Lake. The
country is in very
attractive estates with
large houses, gardens,
fields (wheat-headed but
still green, hedges, bits
of woods.

Soon left lake shore. Some
large apartments.

Then intensively farmed
country with pasture
wheat, a little maize, alfalfa,
and some orchards. Approach
lake again. Some vineyards
on s. slopes.

Nyon

Terrace along lake
intensively farmed -
wheat, some barley, oats,
alfalfa. All but the most
gentle south slopes
are in vineyard. Higher
slopes of range paralleling
~~the~~ lake shore wooded.

After this range is
passed the country generally
is in grain. A small
river ravine partly
wooded.

As far as Lausanne
the pattern is this sort
of farming - not much

vineyard, as there are
few slopes steep enough.
Route is away from lake.
Some small bits of wood.
Lausanne is a large
city.

7:25

Some higher mts. now
visible across the lake.
The smaller houses along
r.r. have very nice gardens.
Most have some vines and
fruit trees, as well as flowers
and ornamental trees.

A deep ravine just out
of Lausanne running down
to lake. r.r. climbs along
a fairly steep slope
through vineyards.
Shirts lake on this slope,
which is probably 300m
or so high. Some small
bits of woods + pasture
where slopes swing to
north or are precipitous.

Left lake at
and into hilly area
that is largely wooded
with Fagus, some pasture.

Then a wide rolling
hilly area mostly pasture
+ some grain on flatter part.
Some hedgerows. Steep
slopes wooded, largely beech.
Some conifer plantations.

No particular pattern except that most of flatter ground is cult. Much of forest now is coniferous - clearly planted, some on rather flat ground. Mixed Abies + Picea.

This rolling landscape is very extensive. No very high or rugged mts to be seen. Rt. is climbing. Perhaps half the land is cult. or in places $\frac{3}{4}$ or more. Some small orchards. Much pasture. Hedgerows of trees. Vanderens.

Some conifer forest, then mostly beech. Much pasture, then mostly cultivation - esp. grains. High mts visible in distance to rt.

This beautiful green rolling landscape continues for a long way.

Romont.

A few scattered large buildings - factories, clumps of apts. More rolling, cult, partly wooded land.

Gradually becomes more hilly + more wooded.

Rosé. Rolling and mostly open again.

Fribourg

a notable river just beyond Fribourg. Then further rolling - hilly country.

Schmitte

More hilly, more wooded. or in hollows a ravine.

Forest mostly beech.

Continues to get more hilly.

Some beets + potatoes, as well as grain.

Flat-lying alluvial flats.

Then much less relief.

Wide flat land around Bern.

8:33

Arr. Bern.

8:57

Left Bern for Lucerne.

Partly cult. (on more level land) partly mixed wood, mainly beech + evergreens (on steeper land).

Following wide valley.

Very rugged partly snow-covered mts, in distance to left.

Rt. is climbing. Some planted forest even on rather level land.

Mostly mixed cult. on valley floor + gentle slopes.

Worb 993

Zägerschi

Country becomes more hilly.

Nice little red-roofed villages.

Könolfingen.

Long rather narrow valley,
cult on floor & lower slopes,
ridges wooded.

Valley gets more hilly
Dummenau.

River.

Rather steep slopes cult. & in
pasture.

Langnau.

Following river. Hills
become abrupt, valley narrows.
Potatoes much cult. Also some beets.

Valley narrows and
becomes a canyon. Sides
wooded, steep. Only lowest
slopes cult. & where there is
a flat bottom.

The valley seems to be
headed up into higher mts.

Scenery is becoming
spectacular.

High wooded slopes, steep
green meadows. Forest mostly
coniferous - Picea.

Then a broad more open valley
with gentler slopes. Pasture
and hay meadow. This continues
a good distance.

Schüpfheim

Entlebuch

River gorge in flat alluvial
beds. Occasionally one sided
cliffs and slopes.

Wolhusen

Gorge becomes more
spectacular. Walls mostly
wooded. Bottom narrow & flat.
Forest mostly beech.

Broadens out again; slopes
more gentle, grassy with
rows of trees. Some
mixed coniferous & beech
forest on slopes. Other hardwoods
on flat ground.

Littau.

Valley much wider but
rather hilly. Hills pastured
& wooded, flat part cult.

Orchards and grain. Orchard
with dense grass ground
cover.

June 25 - trip by boat on Lake
~~Fucine~~ (Lake of the 4 Cantons)

This is a winding lake between enormous peaks and limestone cliffs.

Parts of the shore are sloping up to green meadows on mountain sides with forest on steeper parts and in ravines. These slopes were farmed until roads were built into the area. The farming was poor and when it became possible to bring in food from the outside, the farming was changed to dairying, resulting in the present meadows.

The forests on the Lucerne end of the lake are almost all *Fagus* at anything like the elevation of the lake. Higher up are mixed spruce, beech and spruce forests. The belts of vegetation tend to be lower ~~at~~ on the north and south sides of the Alps and higher in the interior where the climate is more continental. Lake Lucerne is about on the transition between oceanic and continental climate and on the far end of the lake *Pinus sylvestris* tends to replace the *Fagus*. This is

strikingly shown on steep ridges that run down to the lake, where there is beech on the north side and pine on the south. Pine also where the soil is very thin, - growing on limestone.

Where the cliffs are wooded but so steep that neither man nor his domestic animals can go readily the forest is in an almost virgin condition, at least as far as composition is concerned.

On high steep slopes are grassy strips running vertically between strips of forest. These grassy areas are kept clean by avalanches, grazed in summer.

(Data interpreted by Heinz Ellenberg).

Some beautiful folding and fault patterns to be seen in the cliffs ~~is~~ along the lake. Limestone shows some chimney erosion but few karst features.

1966 Switzerland

June 27. Trip up Mt. Pilatus
Left Lucerne by boat, 7:15 a.m.
to Alpnachstad. 7:40
Crossed railway to Pilatus Kulm.
At base of railway the rock
is a thinly bedded phyllitic
shale. Plants on this in
crevices and on slight
accumulations of soil.
2 spp. *Hypericum* in flower.
Silene.

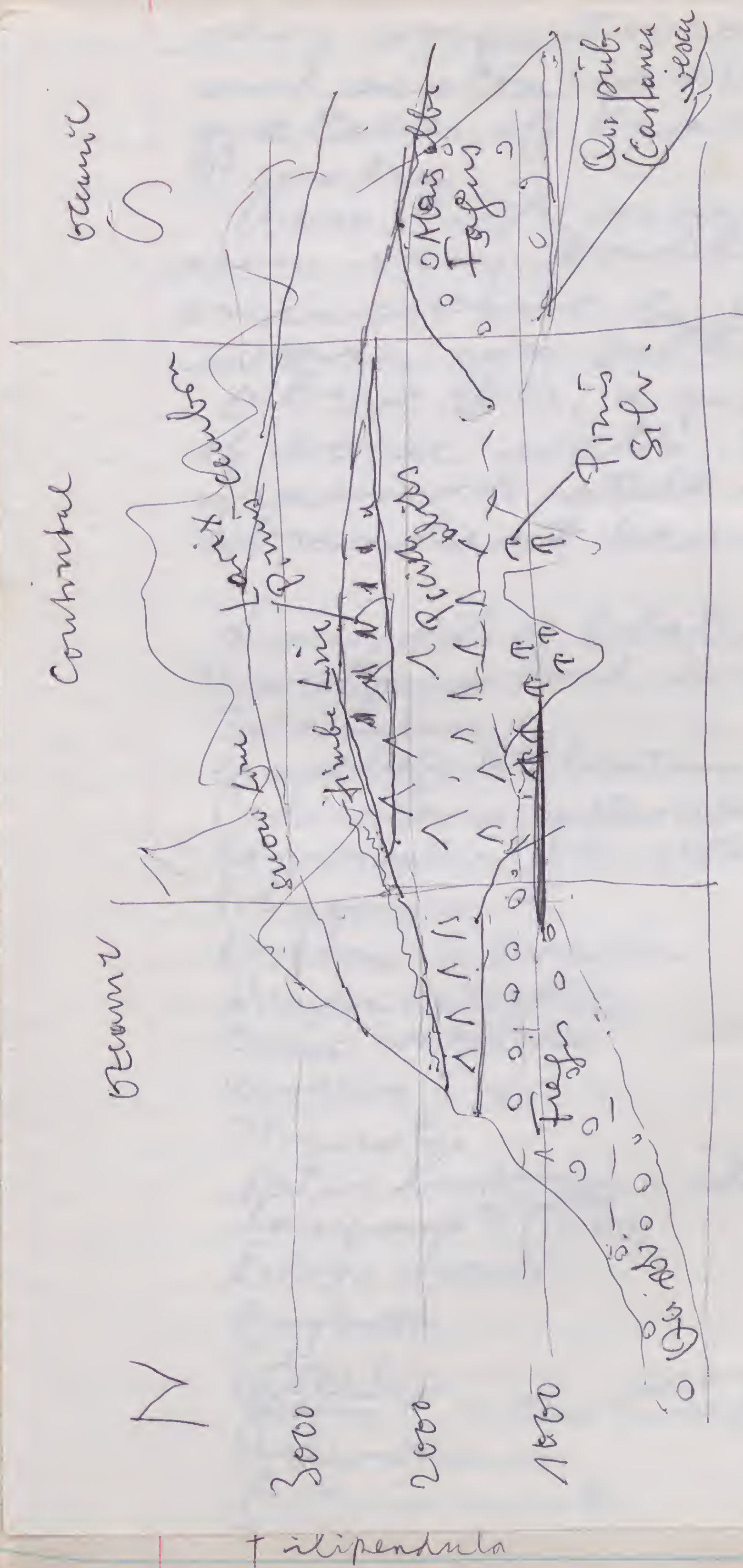
steep meadow with
a number of species of
herbs in flower.

Beech forest, with a little spruce locally. Some admixture of oak, *Pinus*, *Acer*, etc. - *Fragaria*. Little or no undergrowth and only a thin herb layer. Rock changes to limestone a little way up.

Forest becomes scrubby
and mixed upward.
Then more & more coniferous

Upper meadows have many showy flowers.

above Pump Station
the forest is spruce
spruce gradually
and irregularly thins
out, is replaced by
open meadows, scattered
with junipers, this





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2 spp. *Hypericum* in flower.
Silene.

Steep meadow with
a number of species of
herbs in flower.

Beech forest with a
little spruce locally.
Some admixture of oak,
Fraxinus, etc.

Little or no undergrowth
and only a thin herb layer.
Rock changes to limestone
a little way up.

Forest becomes scrubby
and mazelike upward.
Then more & more conifers.

Upper meadows have
many showy flowers.

Above Pump Station

The forest is spruce
spruce gradually
and irregularly thinning
out, is replaced by
open meadows, scattered
patches of *Juniperus*, this

very compact and prostrate
and scattered open
patches of *Pinus*, prob.
P. cembra.

These high meadows
seem very badly overgrazed,
crisscrossed by deeply
worn cow-paths. *Ranunculus*.

Above this, a great deal
of scree with thinner
grass and still very
abundant *Ranunculus*.

Summit of Pilatus

Pod alpina (incl. *virgata* form)

Taraxacum

an umbellifer like *Lomatium*

Pedicularis (yellow) (purple)

Ranunculus (2 spp. white & yellow)

Polygonum

Lagena? or *Arenaria*

Dryas octopetala

Carex compacta

Woodсия? 2 spp.

Myosotis

Salix herbacea & *retusa*

Laxifraga? ^{*airioides*} 2 spp.

Silene acaulis

Oxytropis

Cotula?

Thlaspi or other ^{white} *crucifer*. 2 spp.

Helianthemum

Sesleria caerulea

Filipendula

Anemone (white)
Trollius
Galium
Dominicum
Draba
Cerastium
Arenaria or *alpine*?
Festuca cf. *pumila*

Alpine chough - black
 jay-like bird with wing and
 tail feathers spreading in a
 palmate fashion - dozens
 of them playing in the wind,
 soaring and wheeling,
 apparently just for the
 pleasure of it, around
 the summit ridges.

July 2 - small boat trip
 around north shore of Lake Lucerne
 Lido - Seeburg - Hermitage
 across lake to Tribschen, back
 to Lido and back to Lucerne.

Lower slopes a mosaic of
 beech woods and open
 green meadow. Many
 large houses scattered
 in the landscape, the
 whole with a landscaped
 appearance. Quite a mixture
 of trees along the lake shore.
Populus, *Salix*, *Picea*, *Filix*,
Prunus, *Acer*, *Abies*,
Aesculus, *Betula*.

A swimming beach beyond
 Lido with hundreds of
 people enjoying the sun.

Patches of *Phragmites* here
 and there along the shore in the
 water.

In Lucerne *Rhus typhina*
 is cultivated and makes a
 very attractive ornamental
 shrub.

July 2 - rapid train Lucerne - Zurich
left Lucerne 7 p.m.

Mixed forest and houses -
the forest locally pure beech,
locally pure spruce, locally
mixed. Narrow lake or
dammed river on ~~left~~^{right}, ending
in a marsh, then a flat
narrow valley, a slope
of 50 m. or so on ~~left~~^{right}. Valley
widens gradually. Spruce
forests on higher slopes.
grass on lower. Cultivation
and grass in bottom, scattered
fruit trees & houses, villages.
Then a river on left.

Valley becomes very wide
n. on rt. side. Widens into
a somewhat rolling plain.
Then a lake on rt. scattered
small areas of wood -
beech or spruce, and of
orchards. Mostly grass,
some wheat, potatoes, etc.
Cham.

(stop)

Large lake on rt. some
reed marsh along shore.

Zug

Hill on rt. with areas of forest,
wide plain on left, with
orchards, grass. The orchards
are apparently pastured, and
have dense grass ground cover.

Smaller wooded hills on rt.
Then rolling hilly country
on left; valley on left.
Hills partly orchard and
grass, some woods.

Climbing, dense mixed
wood on rt.

Long tunnel. Came out in a
wooded ravine at Sinsbrugg.
Wooded high hills, small
river.

Another long tunnel.

Came out on left side of
large valley with a
large lake. Wooded partly
grassy slope on left. Houses
below to lake shore. All
sides of this lake seem
to be rather thickly populated.

Thalwil

Houses all have nice gardens,
fruit trees, grape vines, etc.

A small vineyard on ^{east} slope

Hay mowed and drying on r.r. cut.

Zürich Wollishofen

3-Engel

Zürich

r.r. Zürich to Buchs

left 3, 8:41 p.m. Lake on left.

Same route as far as Thalwil.
From Thalwil followed lake
shore

Richterswil

Lugan

Buchs 10:16 p.m.

July 3 - r.r. trip Buchs - Vienna.
Left Buchs 9:34 a.m.

Buchs is an attractive small city in the bottom of a wide U-shaped valley, surrounded by spectacular towering mountains, with bare cliffs, grassy slopes, and forests. The valley floor is flat and quite intensively cultivated.

Crossed bridge over the Rhine into Liechtenstein, going down the same valley, then up a side valley (Jee R.) really a wide extension of the Rhine Valley. Steep slope on rt. covered by a mixed forest of *Larix*, *Picea*, *Pinus sylvestris*, *Sorbus aucuparia*, *Betula*, etc.

Valley floor a debris fan, of grayish glacial till, covered by orchard with grass, and towns & villages.

On east-facing slope forest is mostly beech mixed with conifers.

On west facing, predominantly conifers.

- Feldkirch. (Austria)

Followed Jee V. - lined by beautiful mountains. River rather milky with glacial silt. Valley broadly U-shaped. River lined by mixed deciduous thickets. Forest on mountain slopes mostly coniferous.

- Frastanz

Valley bottom cultivated and pasture, but with thickets and bits of woods. Slopes patchy with meadows, woods, scattered trees.

In valley - potatoes, maize, some kind of grain, pasture. Deciduous thickets, woods mixed deciduous & conifer. Considerable snow on higher mts.

RR follows rt. side of broad Jee Valley, at bottom of very rugged slope, then swings left across the river, through forest on glacial gravel. Largely *Picea*, some *Pinus sylvestris*. Then large meadow area with patches cultivated. Village.

Limestone hill on left with *Pinus sylv.* - really a spur of mts. Other slopes with spruce forest. Small town in corner above it.

A number of villages.
A small branch valley from
it, with very gravelly stream
bed.

Bludenz - spectacular
aiguilles on mt. to left.
Peaks with snow to it.
n. climbs a narrow
valley. Very steep high
slope on it. has a mixture
of beech and spruce; after
a slight turn to it, it
changes to almost pure spruce.
The other slope is gentle
at base, with meadows,
debris cones, very steep, above
this, with meadows and
mixed spruce & beech woods,
and above this towering
cliffs and peaks of almost
bare rock. Several fine
waterfalls.

On it, the steep spruce-
covered slope is cut by
numerous nearly vertical
ravines with bare rocky
beds. Debris cones at bottoms.
Becomes rockier and more
precipitous. Some small
but very high waterfalls.
Forest mostly on debris
cones at foot of cliffs.

RR. goes along a series
of such cones on left of valley.

Valley widens and slope
become more moderate.

Dalaas.

Mosaic of woods and meadow.
Mostly spruce with some
beech on it, more spruce on left.
crossed a terrific canyon entering
from left.

Striking wildflower displays
on unknown bits of meadow.
Salvia, Orchis, Ranunculus,
Anonis, Centaurea, etc.

Climbing all the time.

Snow peaks on it.

rather long tunnel.

Fine spruce forest across valley
on it.

Small village of Klösterle on
flat bottom below it.

Hay drying on slopes and on
flat bottom. med. long tunnel.

Open spruce forest on it.
^{very} ~~short~~ long tunnel. emerges at
Stanton am Arleberg

Valley with grassy lower
slopes, coniferous forest above.
considerable larch with
spruce. Higher slopes bare,
grassy ~~are~~ with snow patches.
Stream now flowing out.
Beautiful high country here.
Bare peaks with patches
of heath and of snow. Small

cirques with snow accumulation.
On valley floor hay is curious
little cylindric-verticillate shocks.

Left slope very steep, rocky,
with mostly *Pinus sylvestris*.
Rt. with spruce + larch,
less rocky.

High peaks on left very
rugged, on rt. less so but
more snowy.

Valley winds

Considerable birch mixed
with the conifers.

Strengen

Valley broader, V-shaped
rather than U-shaped.

Mosaic of meadow + forest.

Then valley mostly wooded,
spruce or pine or mixtures,
depending on slope.

Then mosaic of grass and
wood on gentler slopes,
with magnificent partly
snowy rocky peaks to
left. Valley now more
U-shaped.

Rocky steep slopes mostly
pine covered, very scrubby
above, on left. Some oak
on rt. lower slopes. Spruce above.

Landeck.

Slopes on left pine-covered, on rt.

spruce-covered, some larch,
some birch. A few Austrian

pine in valley bottom.

Pine forest on rock slopes to
left scrubby and open.

Much birch, willow and
other broad-leaved forest in
valley bottom, which is
now rather narrow.

River is now rather wide,
flows through almost a
gorge in places. Mixed
larch and spruce on rt.

Cliffs on left with sparse
scrub pine.

Valley winds som.

General pattern here seems
to be pine - sparse to dense, on
south-facing slopes, and
spruce with larch on
north-facing slopes, broad-leaf
forest on flat bottoms,
esp. near river. Meadow
here and there on either slope,
where gentle enough, and
larger areas on valley floor.
River rather silty.

Then some orchards, a village,
and wide pine forests in
valley bottom.

Bare cliffs on left and
gravelly alluvial fans at base.
Pine forests are on dissected
alluvial fans. Valley very wide here.
Large talus slopes on left.

Otztal. Small lumber mill.

throughout region, where there are meadows, they tend to be dotted with small wooden buildings - prob. barns for storing hay.

Valley has wide floor here. left slope (n side) very rocky + steep, rt. more gentle - meadow + spruce-larch forest.

Becomes much wider, with spectacular mts. on left.

Flat bottom cult. + hay.

Left slopes still pine-covered, rt. spruce-larch.

Big peaks on both sides, those on left very rocky and bare above, with thick pine woods on lower slopes. Those on rt. greener but still bare near summits.

Bottom wide, flat, cult.

Pine forest on slopes to left now very thick. Spruce on rt. with vertical strips of meadows - avalanche paths?

Villages frequent.

Rounded bare-topped peak to left, very jagged one to rt.

Valley widens considerably. River is quite big here. Rugged high range to left.

Innsbruck

left about 1:05 p.m.

Valley below Innsbruck is wide. Mts on north are high, rugged, bare, rocky, a little snow.

Truck garden cultivation in flat parts of valley floor, pasture on rolling or hilly parts, with some forest. Mosaic of meadow with forest on lower slopes to rt.

Several small towns in valley bottom. Dense, tall pine forest on lower slopes to left. Broad-leaf thickets along river. Oak woods on lowest slopes to left.

Valley becomes rather hilly. Hilly parts are a mosaic of wood and meadow, meadow tending to be on gentler slopes.

Mts here are high but not so much so as farther back. Tops are mostly bare, some rugged ones in distance to rt.

Some bare cliffs on left.

Forest on left still mostly pine, on rt. spruce above, mixed with hardwoods below. Jenbach

mts. become somewhat more rugged. Good cliffs on it.

Bald rocky mts. on left.

Remains of a castle on it.

Valley narrows somewhat.

Towns & villages common along valley floor.

Larch-spruce forest on slopes to it. Mixed spruce and broadleaf forest on lowest slopes on left.

Kundl

Mts on it. become steep and rocky.

Bald rocky mts. in distance on left. On it. rounded and wooded.

Wargl.

Beyond Wargl on branches to it. from Inn Valley up a small tributary, bet. beautiful wooded low mts. mixed

spruce & various broadleaf trees. Then pure spruce on it.

Valley winds upward and we leave it, up a slight side valley. Mosaic of grass and forest (mixed).

Climbs sides of this in great curves. Patches of fine spruce forest in meadowland. Low broadleaf trees around edges of spruce.

Mosaic of spruce and grass to tops of mts., here not very high & rugged.

Piles of short, peeled logs in several places - pulpwood?

Slopes becoming steeper and more wooded. Then gentle and more grassy. Hay and pasture in flat bottom.

Valley broadens out. A spectacular cork's comb-like ridge of aiguilles to left.

Large, crowded campground in meadow. A pond with hundreds of people swimming or lying on shores. Rr. going down hill now.

Small city with a diversity of church spires. Rr. makes a loop around it.

Kitzbühel

we go down a small valley from here. This becomes wide and mostly grassy. at foot of cork's comb-like range noted above.

St. Johann.

broad flat valley bottom. Slopes a mosaic of forest and meadow.

Valley becomes hilly, partly wooded with spruce.

Mts on sides rather rocky.

Some beech forest locally on hills in valley. Hilly valley, partly wooded for some distance.

Mts in distance becoming more rugged, some snow patches. m. is climbing. Fine bare rugged peak to left.

Hochfilzen

U shaped valley - rocky bare range on left, gentler wooded mts. on rt. ~ ~.

going down-hill. Peaks to left are spectacular

Middle slopes apparently covered by a dark scrub - Pinus mugo?

Lower slopes by mixed conifer forest + grass.

Striking towers and aiguilles on range to left.

Some of slopes along ~~mt~~ seem to have a mixture of grass and Calluna.

Rugged range on ~~to~~ left and gentler forested one on rt. continue for some time.

Great snow peaks ahead down the valley.

Saalfelden

Turned away from the rugged bare range on left. Both sides wooded with

conifers to tops some meadows. Flat valley bottom in grass or cult. Considerable grade down-hill. Some very heavily grazed slopes to rt.

A lake on left, surrounded by rather steep wooded and grassy slopes.

m skirts shore for some distance.

Zell am See

Below lake the valley is wide and flat. The great snow peaks are at its right.

Logging here seems to be by clear cutting of rather small blocks.

m goes down a ~~small~~ small valley, with larch-spruce woods and meadows on the moderately sloping sides. Stream lined with Alnus.

Small sawmills scattered in this part of the country.

Mixed forest in valley bottom, which is narrow, V-shaped. Spruce above, changing to spruce-birch. End

Valley bottom has deciduous woods and thickets, with meadows.

Valley widens out and becomes U-shaped, but terraced. Spruce forest & mixed spruce-larch-beech, with meadows on gentler slopes.

Schwarzbach - St. Veit

Steep but rather moderate mts. on both sides, wooded to tops, but with many meadows. Woods show signs of much cutting & regeneration.

Valley bottom rather narrow but flat.

a rather large saw-mill.

Slopes ~~hills~~ more grassy than wooded on both sides.

Alders along river-banks. Much beech in forest on lower slopes. Mixed locally with *Filix*, *Carpinus*, *Betula*, *Acer*, etc.

A striking rugged bare range of peaks off to left. (left is west, here).

Sambucus nigra common in thickets.

Bischofshofen

Crossed a fair sized river, then turned to follow it.

A rugged bare range of peaks on mt.

Also on left in distance.

many *siguilles* & domes on mt. upper part bare, then a dark scrub belt. Then spruce and spruce-larch forest down to fairly low alts. where the beech and mixed broadleaf types become dominant just above the valley floor and on ~~the~~ cliffs of river ravine.

On a rather western very rocky steep exposure *Pinus sylvestris* is dominant, to mt. Opposite, less steep, spruce with some broadleaf trees, locally mostly beech.

Valley becomes gorge-like, walls rather bare.

Tunnel, emerge into a broader valley (perhaps same one). Flat bottom, terraced. Very steep mt. on left, small ones on mt. Some snow on those on left. Willow & alder thickets ~~are~~ along river.

Flat land cult. & in grass. Very large saw-mill.

Partly wooded slopes on both sides.

Mts. rather low.

Mixed woods on valley floor for a short way. Floor broad and terraced.

High range to left,
low, wooded to rt. Apparently
mixed conifers + beech.

Valley suddenly widens
much more. Extensive
poplar plantations on
flat land. r. going north.

A sharp pyramidal
peak in distance to left in
plain.

Low mts. to rt. Thickly
wooded with beech with
some conifers.

Salzburg - Agen.

Salzburg.

Hilly densely wooded
area, at least along r.
Some meadows in low
flat places.

Then it opens up some.

Apparently gravel
flats or moraines rather
dissected.

r. still going north.

Wide rolling plain
with a small lake.

r. turns east around
lake. Large area of
Phragmites growing in
water on one side of lake.

but winds a bit. General
direction still north.

Plain is a mosaic of
patches of wood in a matrix

of grass and cultivation.
Woods are mostly spruce.
Low mts. in distance on
both sides. r. has
gradually turned till
it is going east or nearly so,
then north again, then east.
Strasswalchen.

Plain is dotted with
small villages. Some
patches of woods are mixed
deciduous. Quercus fairly common.

Forest becomes less, except
in distance to north, also to
south. Then considerable
area of spruce along r.
Then a wide gently
rolling landscape
with little wood. Then
more hilly and fairly open.
More woods. Willow
thickets along small streams
in open country. Woods,
planted spruce. Mosaic,
predominantly meadow.
Small sawmill. Low hills
mostly wooded.

Country along a small
stream mostly wooded
except a strip of meadow
and cultivation along both
sides of stream.

Then more open land.
Wooded low hills to right.

Tall spruce plantation
along rt. side of r.

Small city.

Rolling country, partly
wooded. Gravel hills.

Small city.

More rolling partly
wooded partly cultivated
and grassy country.

More and more wooded.

Sawmill.

^{thg}

~~Austrian~~ - Puchheim

Flat cultivated plain
Forest in distance on rt.

closer on left. r. going north or
northeast. Plain seems
bordered by low terraces.

City with much industry.

Landscape a series of low
terraces, mostly cultivated.
Grain, sugar beets, etc. hay.

Plain now very extensive,
esp. to rt. a bit low hilly to left.
Mostly open with scattered
trees. Rows of young Populus.
Small city on rt. Fairly large
river on rt.

Some patches of wood on
plain, mostly cult.

Sawmill & other industry.

Large gravel pit.

Outskirts of a city.

Wells

Continued extensive flat
land. Some forests or
plantations of *Pinus sylvestris*.
Mostly cult. and houses.
Orchards, meadows.

Patches of wood few,
mostly broad-leaved.

Thickets along watercourses,
but these few.

Very low rolling hills with
some wood in distance
rt. & left. r. going n.e.
sugar beets, potatoes, grain,
a little alfalfa.

Plain becomes rolling,
but not much forest.

Linz

Crossed a large river.

Flat cultivated and suburban
country, wooded hills in
distance both sides. Lake on
right.

Houses much fewer. Some
thickets and clumps of
low woods, *Salix*?, to left a
few hundred m.

Some grain being harvested.
Crossed a small river.

Woods in distance both
sides. Some close on left.

Patches of mixed broadleaf,
some *Quercus*.

Broad very flat grain fields
some other things.

St. Valentin

Low hilly land on left,
flat on rt. mostly cult.

a patch of *Vicia faba*.

Patches of wood on hilltops.

Scattered trees and hedgerows,
thickets along watercourses.

Rolling hilly land on
both sides, thickets along
watercourses. Mostly cult.

Haag

Oak thickets. Cult. land.

Hedgerows. Wooded watercourses.
Meadows.

Flat cult. valley with
rolling hills on both sides.

Wooded watercourses with salix.

Patches of wood - planted
spruce on slopes.

Follow the small valley for
a good distance. As it
widens out there seem to
be more woods. Pine, Spruce,
Broadleaf thickets. Beech woods.
Small stream on it.

Small city.

Broad flat valley, mostly cult.

Low hills on both sides,

partly wooded.

More *Vicia faba*.

Danube River, very impressive.

Cult. almost to banks.

Plantation of seedling poplar
for a few m. on bank.

River about 100-200 m. wide.
Wooded bluffs on other side.
Then a strip of mixed
woods a few m. wide on
this side.

Low swampy land with salix.

Vöcklabruck

Near Melk the Danube
has a braided course, with
salix forest on banks and
islands.

At Melk is a huge old
structure, probably a
monastery.

From here it leaves river
and goes through gently
rolling cultivated country,
with some patches of woods
on low hills.

July 5 - Vienna

The range of hills surrounding the west side of the city has been protected, legally, for over a hundred years, as a green belt. It is wooded, but the woods are strictly managed. Predominantly *Quercus*, with locally areas of pure *Fagus*. In oak forest understory may be *Acer campestre*. Areas of *Pinus nigra* are angular, obviously planted. Some *Fraxinus*, *Tilia*. Around edges *Acer campestre*, *Crataegus* spp., *Ulmus* sp., *Corylus avellana*. Mixed in here and there a few *Pinus sylvestris*, *Ailanthus altissima*, neither apparently doing very well. A large wide-spreading tree of *Robinia pseudo-acacia* more or less in the open. Very little undergrowth, but this may be because the Austrian foresters like clean forests. Not even much herbaceous ground layer. Some *Galeopsis* (?) and *Asperula*. On the south facing slopes toward Vienna

are vineyards, very little else. These, though privately owned, are a part of the green belt.

The purpose of this green belt is to provide fresh air for the city. Building is strictly prohibited, though there are a couple of restaurants around historic buildings, as one put up by Prince Leopold to celebrate his victory over the Turks. He gave the green belt to the city. The green belt, as well as the large city parks (also to provide fresh air) are strongly supported by the people - though now they are not much used for walking since cars have become common.

The vegetation is said to change markedly southward in this range of hill.

The grain in the vicinity of Vienna is either being harvested, ready to harvest, or almost so.

114

1966 Austria - Switzerland

July 6 - air trip Vienna - Zurich -
Geneva.
Dep. Vienna 6:30. an. Geneva 9:30

115

1966

France

July 9 - crest of Haute-Savoie
 La Grand Salève,
 mountain south of Geneva
 in soil derived from limestone

near les Roches de Faverges^{er}

1260 m.

- 47937 *Campanula persicifolia*
 very local in grassy meadow
 partly shaded
- X2 38 *Brachypodium*
 common in meadows
- ✓2 39 *Koeleria cristata*
 local in semi-shade along road
- ✓2 40 *Alopecurus*
 occasional in meadow
- ✓2 41 *Alopecurus*
 roadside
- ✓2 42 *Satureja*
 road cut
- ✓2 43 *Campanula rotundifolia*
 road cut
- ✓2 44 *Campanula*
 common in meadow
- ✓2 45 *Campanula rotundifolia*
 common in meadow
- ✓2 46 *Campanula glomerata*
 common in meadow
- ✓2 47 *Gentiana*
 common in meadow
- ✓2 48 *Dianthus*
 common in meadow
- around head of La Grande Gorge
- ✓2 49 *Galium verum* L.
 common in meadows

1200 m

flowers blue-violet

leaves yellowish green

fls. violet, palato white,
 marked with maroon

flowers deep purple

flowers violet.

flowers violet

flowers bright crimson-pink

flowers bright yellow.

X 2

Thesium

common locally in meadow

X 2

51

Asperula glauca

occasional in meadow

X 2

52

Dianthus

common on ledges

X 2

53

Armelanthera

common on ledges

X 3

54

Arctostaphylos uva-ursi L.

common on ledges

Ain

July 10 - ^{near} Cold Lac, Jura Mts.

about 20 km. w. of Geneva

on soil derived from limestone

X 2

55

Veronica

common in disturbed forest

X 2

56

Galium odoratum

common in disturbed forest

X 2

57

Galium cruciatum L.

very local ~~on~~ ^{open} among limestone outcroppings in meadow on ^{open} crest of ridge.

X 2

58

Phegopteris dryopteris

very local in beech-spruce forest

X 2

59

Lonicera alpina

rare in small openings in mixed beech-spruce forest

X 2

60

Galium odoratum

common in small openings and along trails in forest

X 1

61

Geranium viviparum

rare in small openings in forest.

(To p. 122)

yellowish green

~~the~~ corolla tube pinkish in bud, flowers white.

corolla bright pink, calyx dull maroon.

shrub 1.5 m. tall,

fruits black when ripe.

forming mats,

leaves glossy; fruit immature.

1750 m

flowers lavender

...

stems erect

1370 m

stems erect, leaves yellowish green, conspicuously reflexed, flowers yellow.

1300 m

shrub 1 m. tall, leaves glossy beneath, flowers bronze-yellowish to red.

stems erect, flowers white

sepals maroon, petals whitish turning reddish bronze.

#7 July 10 Lac Pass,
Jura mts

Road ascends from the village of Farges, first through open land then thickets and irregular brush, then at about 600 m into forest, largely beech and other deciduous trees, some Pines. This forest is clearly regularly logged, and along some branch roads logs are piled. Some areas have been cut over, leaving only a very open stand of saplings of beech, ash, etc. There is much sprouting from the stumps, which are cut close to the ground.

The flora along the road is, of course, much richer and different than that in the forest.

The surfaced road switch-backs up the mountain, branching several times, but main road reaching its highest point at about 1250 m below the Col de Lac.

The forest ~~along~~ the upper part of the road is mainly beech and spruce,

1370 m

with occasional fir. From the end of the road a path goes up a shallow ravine through the forest. Considerably more species seem to occur along the path than in the forest. After the slope becomes gentle the path follows a contour, perhaps climbing slightly, to the left. Very soon ~~the~~ it widens into a long narrow meadow, now wider, now narrow, with abundant *Geranium sylvaticum* and other conspicuous flowers. The forest is clearly invading these meadows. Said to be formerly pastures, now very few cows on them. Tall dense grass and other herbs. Partly shaded. Limestone boulders and outcrops.

Finally just above the Col de Lac the landscape generally is meadow with limestone boulders. *Gentiana lutea* is ~~at~~ very common, also *Thymus* sp. and *Satureja* in rock crevice. Quite an abundant and varied meadow flora.

nos. checked 1966

France

122

Labels typed

47962

Galium pumilum

X 2

common in small openings
and meadows

X 3

63

Satureja

among limestone outcroppings
and boulders on ^{the} summit ridge

1370 m.

stems erect, flowers white

"

flowers bright purple;
plant strongly aromatic
when broken.

123

July Relay Station on
ridge of Bull Run Mts.

crest of ~~ridge~~ ridge is a
quartzite outcrop
low scrub of *Gaylussacia*
baccata between rocks
^{a few *Kalmia latifolia*}
Mature sprouts of
Castanea dentata with
young fruits. *Acer*

Sassafras, *Nyssa*, *Pinus pungens*,
These all large shrubs.
Surrounded by *Quercus*
prinus, some *Populus*
grandidentata.

Willis House in inter-
mountain valley -
quartzite ridge with
almost pure *Quercus*
prinus, *Vaccinium*,
etc. forest on slope
more mixed.

Valley bottom with
small brook with
an area of moist
bottom-land. Rich
herbaceous flora - *Oxodes*,
Lymnecarpus, *Circaea*, *Thalictrum*,
Ansaema, *Desmodium*,
Athyrium, *Galium*,
Smilax, *Carex* spp.
Anemone, *Amphicarpus*, *Apocynum*

nothing in rocky
stream bed, itself.
Good diverse shrub
layer. *Alnus*.

Rolland, old place on the
west slope of the ~~Blue Ridge~~
Bull Run Mts. - above the
house, stables, etc.

at foot of mts. a large
area of second-growth
forest - mixed oaks, tulip,
Pinus ~~etc~~ *rigida*, locust,
ash, persimmon, hickory,
Morus rubra, *Sassafras*,
Nyssa.

irregular, 30% canopy.
a prominent secondary
layer of *Cornus florida* with
some *Cercis*.

Shrub layer
Lindera

Rather diverse herb layer
c *Parthenocissus*
a *Desmodium nudiflorum*
Polystichum
c *Circaea*
c *Rhus toxicodendron*
a *Apocynum*

Each subordinate layer largely composed of young plants of higher layers

As slope increases more and more large boulders show at surface. Forest does not change much.

1966

July 24 - S.W. slope Bull Run Mts., above Roland

in dense second-growth deciduous forest

47964

leg.

x2

very local among sandstone boulders

x5

65

Circaea quadrangulata var. *canadensis* (L.)

Hara

forming a large colony many meters across

x4

66

Ceanothus americana

occasional along an old trail

x5

67

Agrimonia

common along old trail

x4

68

common along old trail

x1

69

Phryma leptostachya L.

rare along old trail

x2

70

Carex

rare along old trail

x2

71

Utricularia perfoliata

abundant

x2

72

Circaea quadrangulata var. *canadensis* (L.) Hara
local

twines, flowers magenta.

terrestrial - bearing rhizomes white, slender, branched; petals white.

suffrutescent herb or sub-shrub, fruit green, erect, flowers deep yellow.

flowers pinkish.

small tufts

flowers white.

nos. checked

128

Labels typed

47973

X 8

X 2 74

1964 Virginia

Galium ~~multiflorum~~ latifolium Michx.

common on slopes

Conopholis americana ^{ca (L.)} Wallr.
very local, near
oak tree and Liriodendron.

129

no. checked

130

1966 Virginia

Labels typed

La 47

July 31 - Elk Wallow
just south of
along Appalachian Trail
in second-growth
deciduous forest on very rocky west slope.

47975 *Galium triflorum* Michx.
common

3 76 *Leptellaria ovata* var. *rugosa* (Wood) Fern.
rare, only a small colony seen.

5 77 *Galium circaezans* Michx.
common

4 78 *Paronychia canadensis*
locally abundant, on
patches of bare soil

3 79 *Agrostis perennans*
rare, along trail

2 80 *Carex alopecuroides* Tuckerm. ?
rare, along trail

2 81 *Amphicarpa bracteata* (L.) Fern.
locally abundant

8 82 *Dennstaedtia punctilobula*
~~common~~ common to abundant

Aug. 1 - Elk Wallow Shelter
in thick woods along
trail

16 83 *Bromus cf. pungens*
locally common

Aug. 1 - Big Meadows Picnic Ground
under trees

2 84 *Agrostis alba* L.
common

Shenandoah Nat. Park 131

prostrate, roots yellow.

erect, filiform - white
stolons abundant.
stems ascending to
erect.

tufts, culms ascending.

culms spreading.

sterile twines.

rhizomes buried.

culms strongly ascending
panicles with branches
drooping.

culms decumbent, spreading
from root crown.

Aug. 1 - Crescent Rocks

Paths are much overgrown.
No *Potentilla* nor *taxifraga* seen. *Hedysotis* abundant, also *Poa*. *Deschampsia*.
Physocarpus and *Crataegus* are abundant. Most of the *Abies* in more exposed places are dead, some of the more sheltered ones still healthy-looking.
Asclepias syriacus in very good flower.

Aug. 1 - east of Riprap Overlook, headw. of

Large flat area and steep slope, covered by rather thin forest. Soil thin, very rocky. Mostly *Quercus prinus*, but some *Q. alba*, *Acer pennsylvanicum*, ~~to~~ *Q. coccinea* (?) or *Q. velutina* (?), *Betula lenta*, with a variable *Ericaceae* shrub layer, up to 3 m. or more tall. *Rhododendron catawbiense* common locally. *Kalmia* more general. *Menziesia* also. *Rhododendron* (*Azalea*) spp. generally common. An almost continuous dwarf shrub layer of

Vaccinium vacillans
V. angustifolium, etc.,
Gaultheria abundant.
Gaylussacia very local.

One area of several acres has *Betula papyrifera* common & abundant - dozens of trees, mostly several- to many stemmed from base. Searched here for *Cornus canadensis* but did not find it.

Labels typed

Aug. 1 - above headw. of
Big Branch, 0.5 km.
e. of Riprap Overlook

in rather thin woods,
largely *Quercus prinus*, ~~with~~
on very rocky thin soil. on north slope

47985 *Betula papyrifera* var. *cordifolia* (Regel) Fern.

very common in very limited area

86 *Viburnum*

under white birches

87 *Hedysotis purpurea* var. *tennifolia*
occasional

88 *Vaccinium angustifolium*
common in dwarf-shrub layer

89 *Vaccinium vacillans*
abundant in dwarf-shrub layer

90 *Gaultheria procumbens*
abundant in dwarf-shrub
layer

91 *Vaccinium vacillans*
abundant in dwarf-shrub layer

92 *Vaccinium*

93 *Rhododendron catawbiense*
scattered locally, on north slope

Aug. 1 - Crescent Rocks

top of sandstone cliffs

94 *Poa*

very common in open in crevices

95 *Agastache nepetoides* (L.) O. Ktze.
rare in thicket

96 *Polygonum convolvulus* L.
common in open in crevices

760 m

2500'

many trunks from base,
8 m. tall, white.
sterile dwarf plants
only, seen.

1 - 2 dm. tall, leaves
dark, semi-pellucid, sterile.
2 - 4 dm. tall, berries blue.

about 1 dm. tall or less,
flowers white

2 - 4 dm. tall; berries blue.

1 - 2 dm. tall, leaves green
on both sides, pellucid-veined.
shrub 3 m. tall.

erect, 0.8 m. tall.

twining.

Labels typed

Aug. 2 - Lands Run Falls
1 1/2 mi. w. of Compton Gap.
on ledges of rock cliffs

47997

Betula

one or two plants

X3

X3

98 *Muhlenbergia cf. sobolifera*
very local

X1

99 *Woodsia obtusa* (Spreng.) Torr.
rare

Aug. 2 - Lands Run, just
inside Park boundary.
narrow flat bottom of
ravine along stream

48000

Verbena antiochensis L.

occasional

X2

X5

01 *Boehmeria cylindrica*

common on rocks in stream

X4

02 *Laportea canadensis*

very common

X3

03 *Galium asprellum*

occasional

X2

04 *Agrimonia rostellata* Vahl. ?

rare

X4

05 (grass)

common

X3

06 *Leonurus cardiaca* L.

common

X1

07 *Hackelia virginiana* (L.) Jtn.

rare

X1

08 *Phryma leptostachya* L.

occasional

X2

09 *Cryptotaenia canadensis* (L.) DC.

common

1850'

300 m

sapling 3 m. tall, 2 cm thick,
bark bright chestnut,
peeling in thin rolls.
culms erect

fronds wilted, dried up
when collected.

400 m

erect; flowers white.

a number of stems from
base.

erect stinging herb,
flowers greenish.

weak, procumbent.

erect; flowers yellow.

erect, very small tufts.

erect, somewhat aromatic
when broken.

flowers white.

nos. checked 1966 Virginia

138

labels typed

48010

Lindera benzoin (L.) Bl.

X4

common

X3

11

Polymnia canadensis L.

common

X1

12

Actinomeris alternifolia (L.) DC.

rare

Aug. 2 - north entrance
to Park just south of
Front Royal

in thickets at edge of woods

X2

13

Gymnocladus dioica (L.) Koch
small colony of
young trees

Shen. Nat. Park

139

aromatic
shrub 2 m. tall,
- fruit green, turning red.
- erect, flowers very pale
- yellowish.
sterile.

200 m

sterile shoot 3 m. tall;
leaves glaucous beneath.

